

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION EXAMINING OPERATIONS

Applicant : Rebecca Klötzer

Group Art Unit: 1711

Serial No.: Divisional of 09/642,390, filed August 18, 2000

Examiner : Bagwell, M.

Filed : (concurrently herewith)

Title : EXPANDED POROUS THERMOPLASTIC POLYMER MEMBRANES  
AND DEVICE FOR THE PRODUCTION THEREOF

PRELIMINARY AMENDMENT

1600 ODS Tower  
601 S.W. Second Avenue  
Portland, Oregon 97204-3157  
January 22, 2002

U.S. Patent & Trademark Office  
BOX PATENT APPLICATION  
P.O. Box 2327  
Arlington, VA 22202

Dear Sir:

Kindly amend the above-identified application as noted below.

In the Specification

At page 1, line 1, delete "AND METHOD" from the title.

At page 1 line 3, insert the following: "This is a divisional of Application Serial No.

09/642,390 filed August 18, 2000. The priority of PCT/EP 99/00286 filed January 19, 1999 and  
DE 198 03 362.1 filed January 29, 1998 is claimed pursuant to USC 35 §§120 and 365(b),  
respectively."

A revised page 1 showing the above amendments is enclosed.

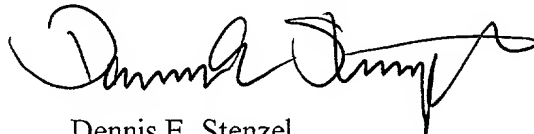
In the Claims

Cancel, without prejudice, claims 1-11.

REMARKS

A Petition for Extension of Time of two months was filed in connection with a Request for Continued Examination of parent application 09/642,390 filed August 18, 2000, and a copy is enclosed herewith. In addition, a copy of a Supplemental Declaration filed in the same parent application is enclosed herewith.

Respectfully submitted,



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CERTIFICATE OF MAILING BY  
"EXPRESS MAIL"

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Date of Deposit: Jan 22 '02

I hereby certify that the patent application attached hereto entitled "EXPANDED POROUS THERMOPLASTIC POLYMER MEMBRANES AND DEVICE FOR THE PRODUCTION THEREOF", Rebecca Klötzer, inventor, is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service on the date indicated above and is addressed to U.S. Patent & Trademark Office, BOX PATENT APPLICATION, P.O. BOX 2327, Arlington, VA 22202 on January 22, 2002.

Dated: Jan 22 '02



Dennis E. Stenzel

EXPANDED POROUS THERMOPLASTIC POLYMER MEMBRANES  
AND DEVICE FOR THE PRODUCTION THEREOF

This is a divisional of Application Serial No. 09/642,390 filed August 18, 2000. The priority of PCT/EP 99/00286 filed January 19, 1999 and DE 198 03 362.1 filed January 29, 1998 is claimed pursuant to USC 35 §§120 and 365(b), respectively.

5 BACKGROUND OF THE INVENTION

Foamed porous membranes are usable for the filtration of fluids in the micro- and macrofiltration range, in particular for prefiltration and final filtration of liquid media in industry, in the laboratory, and in the environmental protection sector.

As described in WO 97/06935, predominantly closed-cell polymer foams with cell sizes of less than  $0.1 \mu\text{m}$  and cell densities of at least  $1.56 \times 10^{14}$  cells/cm<sup>3</sup> (supermicrocellular polymer foams), and with cell sizes of less than  $100 \mu\text{m}$  and cell densities of more than  $10^8$  cells/cm<sup>3</sup> (microcellular polymer foams), can be manufactured by extrusion. The method is characterized by the steps of (a) forming a single-phase polymer/gas solution under pressure, (b) forming the nuclei for gas cells (cell nucleation) by pressure reduction, and (c) effecting cell growth. It is said to be essential to use a gear pump as a throttle valve between the extruder outlet and the nozzle, by which pressure reduction is controlled.

According to WO 92/17533, closed cell foamed films are produced from a foamable polymer and a supercritical fluid. Cell sizes of less than  $1 \mu\text{m}$  and cell densities between  $10^9$  and  $10^{15}$  cells/cm<sup>3</sup> are stated to be achieved. According to this very complex method, the film is produced by way of an extruder with a slit nozzle, a supercritical fluid such as CO<sub>2</sub> is introduced at room temperature to a pressure chamber through which the film is guided via rollers, nucleation takes place upon passage into a second chamber at standard pressure, and cell growth is achieved in the second chamber at a temperature  $> 190^\circ\text{C}$  by feeding the film between heat exchangers and optionally by tempering. Alternatively, the supercritical fluid can also be introduced directly

